

Use Pesticides Safely

The user of pesticides has the responsibility of using them properly. Pesticides are poisonous chemicals that can damage or even kill man, animals, and plants if they are not handled and used properly. Pesticides can be used with little if any risk to man or the environment if certain general principles are observed.

1. Apply pesticides only when they are needed. Properly identify the pest and evaluate the likelihood that it will cause enough damage to justify a pesticide application.
2. Choose the right pesticide and formulation. It should be effective and you should have the knowledge, application equipment and protective clothing and equipment to use it safely.
3. Observe all directions, restrictions, and precautions on the pesticide label. It is dangerous, wasteful, and illegal to do otherwise.
4. Store pesticides behind locked doors, in original containers with labels intact away from food, feed, and clothing and out of the reach of nonresponsible people and animals.
5. Use pesticides at right dosages and intervals to avoid excessive residue and injury to plants and animals.
6. Avoid drift of pesticides into areas where they could harm man or the environment or cause illegal residues. Crops that receive frequent pesticide applications should be planted in non-sensitive areas. Apply pesticides carefully during periods when there is little or no wind.
7. Triple rinse empty, metal and plastic containers. Bury or destroy surplus pesticides and empty containers promptly and properly to prevent water contamination and other perils.
8. After using a pesticide, take a complete shower, including the hair and under fingernails; using a detergent and water. Do not wear clothing again until it has been laundered.

Selecting and Purchasing the Pesticide

1. Identify the pest and decide if it is likely to cause enough damage to justify the use of a pesticide.
2. Select the pesticide and formulation that best fits your needs considering such things as effectiveness, hazard, restrictions on us, your knowledge and experience and the clothing and equipment needed to apply the product properly and safely.
3. Only certified applicators may buy restricted use pesticides. Only certified applicators may use restricted use pesticides or work under the direct supervision of a certified applicator. All pest control technicians working for a chartered company and licensee must be certified.

Hauling the Pesticide

1. The safest way is in the back of a truck with all containers fastened down to prevent breaks and spills.
2. Keep pesticides away from food, feed and passengers.
3. Pesticides should be hauled in properly labeled packages. Keep cardboard or paper packages and labels dry.
4. Do not leave accessible pesticides unattended.
5. Clean up any spills immediately using the correct procedure. Do not flush pesticides down the sewer.

Storing the Pesticide

1. Store pesticides immediately in a locked and posted place that is accessible only to qualified persons where they cannot be reached by children, unqualified people, or animals.
2. Know the type, formulation, and potential danger of pesticides.

3. Store pesticides in their original containers with intact labels. Never place a pesticide in a food or beverage container, even temporarily.
4. Do not store pesticides with food, feed, or seed.
5. Do not store clothing, respirators, lunches, cigarettes, or drinks with pesticides.
6. The storage place should be of fire-resistant construction (including a concrete floor) and adequately protect pesticides from moisture, heat, freezing temperatures and direct sunlight. The storage place should be well ventilated, well lighted and have a lock on the door.
7. Check container frequently for leaks or breaks. Transfer the contents of a damaged container into a labeled container that held exactly the same pesticide. Keep containers tightly closed.
8. Immediately clean up any spills using the correct methods. Keep decontamination supplies available.
6. When mixing or loading, stand so that the wind is from your left or right side so the pesticide does not blow on you.
7. Fill tank 1/2 full with water and add concentrate gradually while water is swirling.
8. Do not spill or splash.
9. If you spill any pesticide on you, remove the contaminated clothing and wash the affected area immediately with detergent and water. Clean up the spill immediately.
10. Place pesticide cans and bags back in storage building and lock.
11. Empty concentrate container, pressure rinse or rinse and drain three times and pour rinsate into mixing tank (triple rinse). Spray rinsate on labeled site.
12. Rinse measuring containers three times.
13. Have someone with you in case of an accident.

Mixing and Loading Pesticides

1. Keep people, pets, and livestock out of the area.
2. Work in a well lighted and ventilated area, preferably outdoors. Do not work alone.
3. Wear tightly woven pants and shirt with legs and sleeves extending over liquid proof boots and gloves, liquid proof apron or raincoat, a wide-brimmed liquid proof hat, goggles and any other protective clothing or equipment that is specified on the pesticide label. Clothes should be closed at neck and wrists. Use common sense and consider the toxicity of the pesticide and your working conditions in deciding on the protection that you need.
4. Read the directions on the pesticide label for amounts and methods before you open the container. Measure carefully and mix only the amounts you intend to use.
5. Keep the container below eye level to avoid splashes or spills. Stand well above fill hole. Close it immediately after use.

Apply the Pesticide

1. Wait until pesticide is needed.
2. Reread label.
3. Wear protective clothing and equipment as specified on the label.
4. Clear the area of people, pets, and livestock.
5. Check your application equipment for leaks and faulty nozzles.
6. Be sure that your equipment is putting out the proper amount of water, dust, or granules. Calibrate spray equipment before adding pesticides.
7. Avoid Drift. Use spray rather than dust, to reduce drift. Spray when there is only a light breeze or no air movement. Use the lowest spraying pressures and largest nozzle orifices that are practical.

8. Never smoke, eat, or drink while applying pesticides.
9. Accidental body contamination: Wash skin immediately (soap and water).
10. Keep trouser legs outside boots.
11. Avoid breathing dusts or fumes.
12. Never apply highly toxic pesticides while alone.
13. Carry a jug of water, soap, and paper towels on spray rig.
14. Change clothing after leaving field and bathe before doing other chores.
15. Observe reentry time.

Cleaning Equipment

1. Mixing, loading and application equipment must be thoroughly cleaned inside and out after each use.
2. Wear protective clothing during cleaning and in making any repairs that are necessary before the equipment is thoroughly cleaned.
3. Clean equipment in an area where drainage will not endanger man or the environment.

Disposal of Excess Pesticides and Empty Containers

1. Use excess pesticides according to label directions if possible. Otherwise, bury them in a special landfill or store them until you can.
2. Metal, plastic, or glass containers should be pressure rinsed or drained and rinsed three times before disposal (triple rinsed). At each rinsing the container should be one-fifth to one-fourth full of water, tightly sealed and upended. All rinse water should be poured into the spray tank and sprayed on a labeled site.
3. Rinsed containers should be punctured or crushed and buried in a sanitary landfill.

If they are buried in an open field, which is discouraged, they should be buried to a depth of at least 18 inches where they will not contaminate surface or subsurface water.

4. Paper and cardboard containers can be buried singly in open fields, taken to a sanitary landfill, or burned in small numbers in open fields. Stay out of fumes and smoke.

Cleanup of Spills

1. Control. Keep people away from the spilled chemical and give first aid if the chemical was spilled on anyone. Wash contaminated person immediately; get individual to a doctor. Take label or pesticide container with you to the doctor.
2. Contain. Confine the spill with sand or soil dikes.
3. If the spill is too big for you to handle or if you do not know what to do, call the manufacturer of the pesticide or the National Agricultural Chemicals Association's Pesticide Safety Team Network at the toll free number: (1-800) 424-9300.
4. Cleanup. Use an absorbent materials, such as soil, sawdust, or a special product to soak up the spill. Shovel all contaminated material into leakproof containers and dispose of it in a special landfill. Spill response kits are now available with chemsorb tubes, chemsorb pillows, nitrite gloves, spill storage bags, non-hazardous label and hazardous label. Oldham Chemical Co. is one source of these kits.
5. If the spill is on a public street or road, call the highway patrol, county sheriff, or city police as appropriate. If someone is killed, injured, or \$50,000 damage, one must notify Department of Transportation (DOT). If a spill in shipment, one must notify the State Regulatory Agency and DOT. Anywhere there is a spill, the State Regulatory Agency should be notified.
6. If water is contaminated, call county health officials.

PROTECTIVE CLOTHING, EQUIPMENT AND HABITS

Pesticides enter the body mainly through the mouth, the respiratory system and the skin. Although most pesticides are much more toxic when swallowed, there is greater likelihood of receiving a toxic dose of certain pesticides through the respiratory tract or the skin. The pesticide label will give you the information on the protection needed to protect yourself from receiving a toxic dose through any of these routes when handling or using specific pesticides. The type of clothing and equipment used will often require a common sense evaluation based on the pesticides' danger and the way in which you are handling or using it. Special consideration should be given to products with the skull and crossbones in respect to protective clothing and equipment.

Long Sleeves and Pants

In general, you should wear a long-sleeved shirt and long pants of tightly woven material when handling any pesticide. Pant legs and shirt sleeves should be worn over boots and gloves. A liquid proof coat or apron may be necessary under certain conditions.

Gloves and Boots

These should be liquid proof and not lined with absorbent fabric. The preferred material is usually neoprene but some pesticides, such as certain fumigants, can penetrate it. Read the pesticide label to be sure.

Hat

A wide-brimmed liquid proof hat will help protect your head, neck, eyes, mouth, and face. Plastic headbands are preferred.

Goggles or Face Shield

Wear one of these when you are handling pesticides. Even the least toxic pesticides can cause problems if they get in your eyes. Bands should be of non-absorbent material.

Respirators

Check the pesticide label to see if you need a respirator. Chemical cartridge respirators are available from most pesticide dealers. These are usually adequate for use outdoors or in well-ventilated areas. Respirators and cartridges should be approved by the National Institute of Occupational Safety and Health (NIOSH) or the Mining Enforcement and Safety Administration (MESA) for the pesticides you are using. Follow the manufacturer's directions on the care and use of the respirator. Change cartridges if odor of chemical comes through or breathing becomes difficult. If you are exposed to a respirator. Wear a self-contained breathing apparatus when oxygen supply is low and you are exposed to high concentrations of highly toxic pesticides in enclosed areas.

Care of Clothing

1. Change clothing daily and change at once if it gets wet with spray. Change before doing other chores.
2. Clothing that is wet with highly toxic pesticide spray or pesticide concentrate should be destroyed.
3. Never store or wash pesticide-contaminated clothing with other laundry.
4. Wash hats, gloves, boots, and goggles or face shields daily. Test gloves for leaks by filling them with water and gently squeezing.

Personal Hygiene

1. When using or handling pesticides, do not eat, drink or smoke until you have washed your hands and face with detergent and water.
2. After working with pesticides or pesticide contaminated equipment, take a good shower. Wash your hair as well as your body and clean your fingernails.
3. Anytime that you spill a pesticide on yourself, remove contaminated clothing and wash immediately.

SYMPTOMS OF PESTICIDE POISONING

You should know the signs and symptoms of poisoning by the pesticides you use in order to protect yourself and co-workers. If you think that someone has been poisoned, get medical help immediately. If you think someone has been poisoned, do not leave him alone. When taking the patient to the doctor or hospital, take the pesticide label or the entire container, if necessary, with you. However, do not carry the pesticide container in the passenger space of a car or truck.

Organic Phosphate Pesticides

These include pesticides such as parathion, phosdrin, monitor, Systox*, and Guthion*. Symptoms almost always begin within 12 hours after exposure. They usually occur in approximately the order that they are listed:

Mild Poisoning: Fatigue, headache, dizziness, blurred or dark vision, excess sweat and saliva, nausea and vomiting, stomach cramps and diarrhea.

Moderate Poisoning: Difficulty in walking, weakness, chest discomfort, muscle twitches, pinpoint pupils, increased severity of earlier symptoms.

Severe Poisoning: Unconsciousness, severely pinpointed pupils, muscle twitches, secretions from mouth and nose, breathing difficulty, death if not treated.

Carbamate Pesticides

Methomyl, Temik*, and Sevin* are examples of this group. They cause about the same symptoms as the organic phosphates, but the poisoning is more easily treated by a physician.

Chlorinated Hydrocarbon Pesticides

Examples are chlordane, lindane, and methoxychlor. Not many chlorinated hydrocarbon pesticides have poisoned pesticide users.

Early indications of poisoning include headache, nausea, vomiting, general discomfort and dizziness. The victim may also be unusually excited or irritable. With severe poisoning, convulsions occur with or without earlier symptoms. Coma may follow the convulsions.

Fumigants and Solvents

The poisoned person may appear to be drunk. Symptoms are poor coordination, slurring words, confusion, and sleepiness.

FIRST AID PROCEDURE

1. Read the directions in the "Statement of Practical Treatment" that is on the pesticide label.
2. Clear airway; maintain respiration -- clear breathing passage and use artificial respiration if necessary.
3. Administer proper antidote as soon as possible. In case of severe poisoning with organophosphate, administer 2-PAM with atropine sulfate. Atropine sulfate may be used with carbamates. These are not used with all other types of pesticides.
4. If you inhale a pesticide, get to fresh air at once.
5. If you get a pesticide in your mouth or swallow it, rinse your mouth with plenty of water. Give syrup of ipecac to induce vomiting for organophosphates and carbamates. Go or be taken to a physician at once. Do not cause vomiting unless specifically instructed by the pesticide label.
6. If there is any doubt, call a physician.

* Indicates trade name

PESTICIDE USE AND GROUNDWATER PROTECTION

How Can Pesticides Get Into Groundwater?

Pesticides can gain direct access to groundwater by pesticide spills around a poorly sealed well, back-siphonage during spray tank filling or improper disposal of pesticide containers. Another, though less direct, contamination route is pesticide movement down through the soil into groundwater. This can happen in areas of concentrated pesticide usage such as mixing areas or disposal areas or spills on the ground. Pesticides and other chemicals may contaminate soil or surface water as a result of accidents in manufacturing, storage and handling, transportation or from improperly constructed disposal sites or holding facilities. In these situations, large quantities of contaminants have the potential of entering the groundwater at small defined locations, known as point pollution sources. Recently, there has been concern about movement of pesticides through the soil into groundwater when pesticides are applied to fields under normal farming practices. These are said to be nonpoint pollution sources.

What Can We Do To Protect Our Groundwater Supplies?

- * Evaluate the need, method and frequency of chemical control.
- * Identify the vulnerability of the soil. (Identify soil type).
- * Consider the location of the pesticide application in relation to ground and surface water.
- * Follow the directions on the pesticide label.
- * Become familiar with pesticides that may leach.
- * Apply the pesticide at the appropriate time.
- * Measure the pesticide properly and carefully.
- * Calibrate and maintain equipment properly.
- * Avoid spills, back-siphoning and overspraying.

- * Direct the application to the target site.
- * Triple rinse tanks and dispose of pesticides and containers properly.
- * Store pesticides safely.
- * Maintain records of pesticide use.
- * Delay irrigation after pesticide applications.
- * Avoid irrigation runoff.
- * Exercise care when practicing chemigation.
- * Check the well system (properly sealed).
- * Use the integrated pest management (IPM) practices.

SOLID WASTE MANAGEMENT FIELD OFFICES

(Request for local pesticide disposal)

901-529-6695	Memphis
731-424-9200	Jackson
615-741-0654	Nashville
931-432-4015	Cookeville
423-624-9921	Chattanooga
865-594-6466	Knoxville
423-928-6487	Johnson City
615-741-3424	Solid Waste
	Management Central Office
	(To obtain an emergency identification number for pesticide disposal)

EPA APPROVED SANITARY LANDFILLS

Waste Management of Alabama, Inc.
P.O. Box 55
Emelle, Alabama 35459
(205) 652-9531

S.C.A. Services, Inc.
P.O. Box 158
Pinewood, S.C. 29125
(803) 452-5003

PESTICIDE INFORMATION PHONE NUMBERS

NON-EMERGENCY NUMBERS

1-404-542-6751	Georgia Animal Poison Control Ctr. Serves southeastern region (For aid with any type of animal poisoning incidents, information available 8 a.m. to 5 p.m. Monday thru Friday)
1-615-837-5523	Tennessee Department of Agriculture, Regulatory Services Division Report all pesticide spills or misuses
1-800-424-8802	National Response Center Hotline Report CERCLA hazardous substances above the reportable quantity
1-800-535-0202	Emergency Planning & Community Right-To-Know Information hotline on Title III of SARA
1-800-262-3300	State Emergency Response Council Report storage of extremely hazardous chemicals equal to or in excess of the "threshold planning quantity"

Contacts for Pesticide Accidents and Spills

These are emergency numbers one can call for help when people have been exposed to pesticides or there has been a pesticide spill. Other contacts may be made to obtain non-emergency information.

For Pesticide Spill on State or Federal Highways

- * Dial 911. Inform operator you need to contact the Tennessee Highway Patrol (local police or sheriff for spill on local city or rural roads or private land) and the local fire department that a pesticide spill has occurred.
- * Contact CHEMTREC at 1-800/424-9300 for assistance.

When People Have Been Exposed to Pesticides

- * Dial 911. Notify the operator that the problem is a pesticide exposure.
- * Provide an accurate location and information on the type of pesticide involved.
- * Determine if spill has taken place.
- * Contact Tennessee Department of Agriculture 615/837-5523

In case of poisoning, call a physician, the nearest Tennessee poison control center or the National Pesticide Safety Team Network. Provide the following information: name, age and sex of victim; identify yourself and your relationship to the victim; identify the pesticide to which the victim has been exposed, type of exposure (inhaled, dermal exposure, or ingested), and if known, how much exposure.

Emergency pesticide control telephone numbers for Tennessee

Human Pesticide Emergency Poison Control Center:	1-800-222-1222
General Questions on Pesticides EPA National Pesticide Telecommunications Network	(800) 858-7378
Pesticide Emergency National Pesticide Safety Team Network - Chemtrec	(800) 424-9300
Non-emergency Pesticide Information Chemtrec Information Hotline	(800) 262-8200
Animal Pesticide Emergency National Animal Pesticide Control Center (may be a fee charged)	(888) 426-4435

Precautionary Statement

To protect people and the environment, pesticides should be used safely.

This is everyone's responsibility, especially the user.

Read and follow label directions carefully before you mix, apply store or dispose of a pesticide.

According to laws regulating pesticides, they must be used only as directed by the label.

Persons who do not obey the law will be subject to penalties.

Disclaimer Statement

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide regulations are continuously reviewed.

Should registration or a recommended pesticide be canceled, it would no longer be recommended by The University of Tennessee.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture,
and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service Charles L. Norman, Dean